

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

**Claims 1-7 (Cancelled)**

1           **Claim 8 (currently amended):** An infrared ray lamp  
2           comprising:

3           a heating element which is formed of a carbon-based  
4           substance including at least crystallized carbon, a  
5           resistance value adjustment substance and amorphous  
6           carbon which has a substantially plate shape, the width  
7           of which is larger than its thickness by five times or  
8           more,

9           a glass tube in which said heating element is  
10          hermetically sealed, and

11          an electrode embedded at both end portions of said  
12          glass tube, electrically connected to both ends of said  
13          heating element respectively and also electrically  
14          connected to an external electric circuit,

15          a connection device which is secured to each end  
16          portion of said heating element, thereby electrically  
17          connected to said heating element, and

18          a lead wire having a spring portion which is secured  
19          to said connecting device and said electrode and pulls

20     said heating element at a predetermined tension, and  
21     electrically connecting said connecting device and said  
22     electrode.

1           **Claim 9 (currently amended):** An infrared ray lamp in  
2     accordance with claim 8, wherein  
3           the spring portion of said lead wire is formed in a  
4     spiral shape, and  
5           said spring portion has a larger diameter than the  
6     width of said heating element further comprising:  
7     ~~—— a connection device secured to both end portions of~~  
8     ~~said heating element respectively and electrically~~  
9     ~~connected to said heating element, and~~  
10    ~~—— lead wires secured to said connection devices and~~  
11    ~~said electrodes so as to pull both ends of said heating~~  
12    ~~element at a predetermined tension and used to~~  
13    ~~electrically connect said connection devices to said~~  
14    ~~electrodes.~~

**Claim 10 (cancelled)**

1           **Claim 11 (original):** An infrared ray lamp in  
2     accordance with claim 8, wherein a reflection film for  
3     reflecting infrared rays is provided on the internal or  
4     external face of said glass tube so that the emission  
5     intensity of said infrared rays emitted from said heating

6 element has a predetermined distribution.

1           **Claim 12 (original):** An infrared ray lamp in  
2 accordance with claim 11, wherein said reflection film  
3 having a semicylindrical shape being substantially  
4 coaxial with the center line of said heating element in  
5 the longitudinal direction thereof is provided along  
6 substantially similar length as that of the infrared ray  
7 emitting portion of said heating element.

1           **Claim 13 (original):** An infrared ray lamp in  
2 accordance with claim 11, wherein the cross section of  
3 said reflection film has a shape formed of a part of a  
4 parabola having its focus substantially on the center  
5 line of said heating element in the longitudinal  
6 direction thereof, along substantially similar length as  
7 that of the infrared ray emitting portion of said heating  
8 element.

1           **Claim 14 (original):** An infrared ray lamp in  
2 accordance with claim 11, wherein the cross section of  
3 said reflection film has a shape formed of a part of an  
4 ellipse having one of its focuses substantially on the  
5 center line of said heating element in the longitudinal  
6 direction thereof, along substantially similar length as  
7 that of the infrared ray emitting portion of said heating

8 element.

1           **Claim 15 (original):** An infrared ray lamp in  
2 accordance with claim 12, wherein the central portion of  
3 the cross section of said reflection film is disposed so  
4 as to be opposed to the wider side portion of said  
5 heating element.

1           **Claim 16 (original):** An infrared ray lamp in  
2 accordance with claim 12, wherein the central portion of  
3 the cross section of said reflection film is disposed so  
4 as to be opposed to the narrower side portion of said  
5 heating element.

1           **Claim 17 (currently amended):** A heating apparatus  
2 provided with an infrared ray lamp comprising:  
3           a heating element which is formed of a carbon-based  
4 substance including at least crystallized carbon, a  
5 resistance value adjustment substance and amorphous  
6 carbon, and which has a substantially plate shape, the  
7 width of which is larger than its thickness by five times  
8 or more,  
9           a glass tube in which said heating element is  
10 hermetically sealed, and  
11           an electrode embedded at both end portions of said  
12 glass tube, electrically connected to both ends of said

13 heating element respectively and also electrically  
14 connected to an external electric circuit,  
15 a connection device which is secured to each end  
16 portion of said heating element, thereby electrically  
17 connected to said heating element, and  
18 a lead wire having a spring portion which is secured  
19 to said connecting device and said electrode and pulls  
20 said heating element at a predetermined tension, and  
21 electrically connecting said connecting device and said  
22 electrode.

1 **Claim 18 (currently amended):** A heating apparatus in  
2 accordance with claim 17, wherein

3 the spring portion of said lead wire is formed in a  
4 spiral shape, and

5 said spring portion has a larger diameter than the  
6 width of said heating element

7 ~~said infrared ray lamp further comprises:~~

8 ~~a connection device secured to both end portions of~~  
9 ~~said heating element respectively and~~  
10 ~~electrically connected to said heating element, and~~

11 ~~lead wires secured to said connection devices and~~  
12 ~~said electrodes so as to pull both ends of said heating~~  
13 ~~element at a predetermined tension and used to~~  
14 ~~electrically connect said connection devices to said~~  
15 ~~electrodes.~~

1           **Claim 19 (original):** A heating apparatus in  
2           accordance with claim 17 or 18, further comprising a  
3           reflection plate for reflecting infrared rays so that the  
4           intensity of said infrared rays emitted from said  
5           heating element has a predetermined directional  
6           distribution.

1           **Claim 20 (currently amended):** A heating apparatus in  
2           accordance with claim [[18]] 19, wherein said reflection  
3           plate has a semi-cylindrical shape being substantially  
4           coaxial with the center axis of said infrared ray lamp.

1           **Claim 21 (currently amended):** A heating apparatus  
2           in accordance with claim [[18]] 19, wherein the cross  
3           section of said reflection plate has a shape formed of a  
4           part of a parabola having its focus substantially on the  
5           center axis of said infrared ray lamp.

1           **Claim 22 (currently amended):** A heating apparatus  
2           in accordance with claim [[18]] 19, wherein the cross  
3           section of said reflection plate has a shape formed of a  
4           part of an ellipse having one of its focuses  
5           substantially on the center axis of said infrared ray  
6           lamp.

1           **Claim 23 (original):** A heating apparatus in  
2           accordance with claim 19, wherein the central portion of  
3           the cross section of said reflection plate is disposed so  
4           as to be opposed to the wider side portion of said  
5           heating element.

1           **Claim 24 (original):** A heating apparatus in  
2           accordance with claim 19, wherein the central portion of  
3           the cross section of said reflection plate is disposed so  
4           as to be opposed to the narrower side portion of said  
5           heating element.

1           **Claim 25 (currently amended):** A method of producing  
2           an infrared ray lamp, comprising:  
3           a step of forming a heating element which is formed  
4           of a carbon-based substance including at least  
5           crystallized carbon, a resistance value adjustment  
6           substance and amorphous carbon into a substantially plate  
7           shape, the width of which is larger than its thickness by  
8           five times or more,  
9           a step of disposing a lead wire having a spring  
10          portion which pulls said heating element at a  
11          predetermined tension,  
12          ~~a step of forming a glass tube by forming glass into~~  
13          ~~a substantially cylindrical shape,~~  
14          a step of hermetically sealing a substantially plate

15 ~~said~~ heating element, ~~the width of which is larger than~~  
16 ~~its thickness by five times or more,~~ inside said glass  
17 tube so that the center line of said heating element in  
18 the longitudinal direction thereof is substantially  
19 coaxial with the center axis of said glass tube, and

20 a step of forming a reflection film for reflecting  
21 infrared rays into a substantially semi-cylindrical shape  
22 on the external face of the cylindrical shape of said  
23 glass tube so as to substantially include the range of  
24 the disposition of said heating element in the axial  
25 direction thereof.

1 **Claim 26 (currently amended):** A method of producing  
2 an infrared ray lamp, comprising:

3 a step of forming a heating element which is formed  
4 of a carbon-based substance including at least  
5 crystallized carbon, a resistance value adjustment  
6 substance and amorphous carbon into a substantially plate  
7 shape, the width of which is larger than its thickness by  
8 five times or more,

9 ~~a step of forming a glass tube by forming glass into~~  
10 ~~a substantially cylindrical shape,~~

11 a step of forming a reflection film for reflecting  
12 infrared rays into a predetermined substantially  
13 semi-cylindrical shape on the external face or the  
14 internal face of the cylindrical shape of said glass



15 tube, ~~and~~  
16 a step of disposing a lead wire having a spring  
17 portion which pulls said heating element at a  
18 predetermined tension, and  
19 a step of disposing ~~a substantially plate~~ said  
20 heating element, ~~the width of which is larger than its~~  
21 ~~thickness by five times or more,~~ so as to be included in  
22 the axial range wherein said reflection film is disposed,  
23 and of hermetically sealing said heating element inside  
24 said glass tube.

1 **Claim 27 (currently amended):** An infrared ray lamp  
2 comprising:  
3 a heating element having a substantially plate  
4 shape, the width of which is larger than its thickness by  
5 five times or more, and being formed of a carbon-based  
6 substance including at least crystallized carbon, a  
7 resistance value adjustment substance and amorphous  
8 carbon,  
9 a heat emitting block ~~which is formed of a~~  
10 ~~conductive material and electrically connected to one end~~  
11 having a good conductivity which is bonded to each end  
12 portion of said heating element,  
13 an internal lead wire having a close-contact portion  
14 wound around said heat-emitting block and a spring  
15 portion.

16           a glass tube in which said heating element, said  
17           heat emitting block, said close-contact portion, and said  
18           spring portion is hermetically sealed, and  
19           an electrode embedded at both end portions of said  
20           glass tube, electrically connected to ~~both ends of said~~  
21           ~~heating element~~ said inner lead wire respectively and  
22           also electrically connected to an external electric  
23           circuit.

1           **Claim 28 (previously presented):** A heating apparatus  
2           provided with an infrared ray lamp comprising,

3           a heating element having a substantially plate  
4           shape, the width of which is larger than its thickness by  
5           five times or more, and being formed of a carbon-based  
6           substance including at least crystallized carbon, a  
7           resistance value adjustment substance and amorphous  
8           carbon,

9           a heat emitting block ~~which is formed of conductive~~  
10           ~~material and electrically connected to one end of~~ having  
11           a good conductivity which is bonded to each end portion  
12           of said heating element,

13           an internal lead wire having a close-contact portion  
14           wound around said heat-emitting block and a spring  
15           portion,

16           a glass tube in which said heating element, said  
17           heat emitting block, said close-contact portion, and said

18     spring portion is hermetically sealed, and  
19             an electrode embedded at both end portions of said  
20     glass tube, electrically connected to ~~both ends of said~~  
21     ~~heating element~~ said inner lead wire respectively and  
22     also electrically connected to an external electric  
23     circuit.

**Amendments to the Drawings:**

The attached sheet of drawings includes changes to Figs. 9, 11, 12, 14, 15, 17, 20, 24 and 26.

Each drawing has been amended to include appropriate figure labels (Fig. 9(a), Fig. 9(b) etc.).

Figs. 20-26 have been labeled "Prior Art".

Attachment: Replacement Sheet (13 sheets)

Annotated Sheet Showing Changes (13 sheets)